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*Final*

# **Beale Air Force Base Site 8 SVE and Biovent System Remedial Action Summary Report**

Project No.: BAEY 2004-7008  
Contract No.: FA8903-04-D-8670  
Task Order: 0078

CDRLs A001F, A003, B010

Submitted to  
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**CH2MHILL**

# Introduction

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This Remedial Action (RA) Summary Report (Summary Report) was developed under the Air Force Center for Environmental Excellence (AFCEE), Contract Number FA8903-04-D-8670 under Task Order (TO) No. 0078 (BAEY 2004-7008). The scope for this effort is described in the AFCEE Statement of Work, dated May 10, 2004. This Summary Report fulfills contract data requirements list (CDRL) A001F, A003, and B010.

This Summary Report documents the methods, procedures, and description of the construction activities that took place during the construction of the soil vapor extraction (SVE) system and biovent system at Site SD-08 (Site 8) at Beale Air Force Base (AFB or Base). The Base is located in the Sacramento Valley, approximately 40 miles north of Sacramento and 13 miles east of Marysville, as shown on Figure 1-1. The following sections provide a description of the remedial action that was implemented at Site 8.

## 1.1 Project Overview

Field activities conducted in 2004 and 2005, which are summarized in this report, support the following components of the Site 8 remedial action under TO 0078:

- Construction of an SVE system to remove volatile organic compound (VOC) contamination impacting the vadose zone and groundwater at Site 8
- Construction of a biovent system to remediate total petroleum hydrocarbon (TPH) contamination impacting the vadose zone and groundwater at Site 8
- Installation of a network of vapor monitoring points (VMP) to evaluate system performance
- Operation and maintenance (O&M) of the SVE and biovent systems for 1 year

This Summary Report has been developed to describe the activities that occurred during the construction phase of this project. An additional O&M Plan was developed (CH2M HILL HILL, 2005a) to describe the planned O&M activities for the SVE and biovent systems.

## 1.2 Project Goals and Objectives

The goals of the project (implementing SVE and bioventing at Site 8) are as follows:

- Provide immediate protection of human health, welfare, and the environment from potential risks associated with contaminants in vadose-zone soils.
- Remediate vadose-zone soil to prevent further degradation of underlying groundwater.

- Perform the removal action in a manner consistent with the planned land use for Site 8, which includes ongoing industrial uses.

The primary objectives of this Summary Report include the following:

- Describe the methods and procedures used during construction.
- Provide a detailed description of the construction activities.
- Describe how the project goals were met and any deviations from those goals.

## 1.3 Report Organization

This Summary Report is organized as follows:

- Section 1.0: Introduction
- Section 2.0: Background
- Section 3.0: Summary of Construction and Field Activities
- Section 4.0: Project Chronology
- Section 5.0: Conclusion
- Section 6.0: Works Cited

Supporting information is provided in the following appendixes:

- Appendix A: Permits
- Appendix B: Boring Logs
- Appendix C: Well Completion Diagrams for Wells
- Appendix D: Non-Hazardous Waste Manifest
- Appendix E: Drawings
- Appendix F: Analytical Data and Validated Data Summary
- Appendix G: Field Reports
- Appendix H: Photo Documentation
- Appendix I: Agency Comments

**TABLE 3-6**

Summary of Deviations from Site 8 SVE and Biovent System Installation Work Plan  
*Site 8 Remedial Action Summary Report, Beale Air Force Base, California*

Planned Action(s)	Description	Reason	Actual Action(s)
Install SVE wells (08C040VEWS and 08C040VEWD) and a VMP (08C032VMP) in their proposed locations.	Proposed locations of SVE wells and VMPs varied slightly to accommodate drill rigs operating in the area.	Power poles and power lines were located in the vicinity of proposed SVE well and VMP locations.	Moved the location of these wells to obtain the proper clearance for drill rigs to operate in the area.
Soil and EnCore® soil samples were to be collected at depths within this hard layer (between 60 and 80 feet bgs) per the Work Plan.	Continuous core samples could not be obtained using hollow-stem auger drilling techniques within a hard cobble layer at approximately 70 feet bgs. Therefore, soil and EnCore® soil samples could not be collected in this hard layer ranging from 16 to 20 feet in thickness.	Presence of hard pan layer between 60 and 80 feet bgs.	Soil and EnCore® soil samples were collected immediately following this hard layer.
Soil vapor samples were to be collected at depths within this hard layer (between 60 and 80 feet bgs) per the Work Plan.	Soil vapor probe samples could not be driven into the cobble layer, regardless of the drilling method used. Therefore, soil vapor samples could not be collected in this hard layer.	Presence of hard pan layer between 60 and 80 feet bgs.	Soil vapor samples were collected immediately following this hard layer.
Screen intervals were to be located at depths within this hard layer (between 60 and 80 feet bgs) per the Work Plan.	Screen intervals varied slightly to locate the intervals within subsurface formations that could provide better air flow to effectively remediate vadose zone contaminants.	Presence of hard pan layer between 60 and 80 feet bgs.	Screen intervals were installed immediately following this hard layer.
Construct a fence to contain process equipment, carbon vessels, and electrical service.	An existing fence around the site eliminated the need to construct a fence around the remediation systems.	An existing gate and fence provides the necessary security for the SVE and biovent system.	A fence was not constructed around the SVE and biovent compound.
Coordinate with vendor to purchase a new skid-mounted SVE system.	Recognized a cost savings by not purchasing a new skid-mounted SVE system.	Utilized existing SVE equipment (carbon vessels and a blower).	Utilized SVE equipment formerly used at Site 31.

# Conclusion

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The SVE system was started in early January 2005 and was shut down in late January 2005 because of a flow restriction in the lag VGAC vessel. The SVE system was restarted in April 2005. The Biovent system has been running continuously since February 2005, with the exception of the time during In-Situ Respiration (ISR) tests. ISR testing was completed in May 2005. Long-term operations and maintenance activities of the systems are documented in the Long Term Monitoring and Operations Basewide Groundwater Monitoring Program Semi Annual Data Summary (CH2M HILL, 2004a).